

**IN THE CLAIMS:**

1. (Original) A method of controlling the fabrication of an optical device having a given property at a defined wavelength, the method comprising:

providing a substrate;

depositing a material on the substrate to form a film thereon;

controlling a set of manufacturing parameters as the film is being formed on the substrate to make the optical device;

generating an optical signal having a given wavelength;

dithering the wavelength of the optical signal;

applying the dithered optical signal to the film being formed on the substrate to modulate the optical signal; and

using a feedback control, through a state machine with a wavelength locked loop, to generate correlation signal representing the difference between the given wavelength and the defined wavelength and to use the correlation signal to adjust at least one of the manufacturing parameters to make the optical device with said given property at the defined wavelength.

2. (Original) A method according to Claim 1, wherein the film transmits a signal modulated by the difference between the defined wavelength and the given wavelength of the optical signal, and step of using a feedback control with a wavelength locked loop includes the step of positioning a sensor to receive the signal transmitted from the film and to generate a signal representing said difference.

3. (Original) A method according to Claim 2, wherein the step of using a feedback control with a wavelength locked loop further includes the steps of processing the signal generated by the sensor to generate the correlation signal, and applying the processed signal to adjust said at least one of the manufacturing parameters.

4. (Original) A method of controlling the fabrication of an optical device having a given property at a defined wavelength, the method comprising:

providing a substrate;

depositing a material on the substrate to form a film thereon;

controlling a set of manufacturing parameters as the film is being formed on the substrate to make the optical device;

generating an optical signal having a given wavelength;

dithering the wavelength of the optical signal;

applying the dithered optical signal to the film being formed on the substrate to modulate the optical signal;

generating a correlation signal representing the difference between the given wavelength and the defined wavelength; and

using the correlation signal to adjust at least one of the manufacturing parameters to make the optical device with said given property at the defined wavelength.

5. (Original) A method according to Claim 4, wherein the steps of generating the optical signal, dithering the wavelength of the optical signal, applying the optical signal to the film, generating the correlation signal, and using the correlation signal all occur during the depositing step to provide a real-time control of the fabrication of the optical element.

6. (Original) A method according to Claim 4, wherein the film transmits a signal modulated by the difference between the defined wavelength and the given wavelength of the optical signal, and the generating step includes the step of positioning a sensor to receive the signal transmitted from the film and to generate a signal representing said difference.

7. (Original) A method according to Claim 6, wherein the generating step further includes the step of processing the signal generated by the sensor to generate the correlation signal.

8. (Original) A method according to Claim 4, wherein the applying step includes the step of transmitting the optical signal through the film.

9. (Original) A method according to Claim 4, wherein the applying step includes the step of reflecting the optical signal from the filter.

10. (Original) A method according to Claim 4, wherein:

the depositing step includes the step of depositing the material on the substrate at an adjustable rate; and

the using step includes the step of using the correlation signal to adjust the rate at which the material is being deposited on the substrate.

11. (Currently Amended) A system for controlling the fabrication of an optical device having a given property at a defined wavelength, the ~~method~~ system comprising:

means for depositing a material on an optical substrate to form a film thereon;

a control subsystem for controlling a set of manufacturing parameters as the film is being formed on the substrate to make the optical device;

a light subsystem for generating an optical signal having a given wavelength and for applying the optical signal to the film being formed on the substrate to modulate the optical signal;

a dither source for generating a dither signal for dithering the given wavelength of the optical signal;

a feedback circuit for generating a correlation signal representing the difference between the dithered given wavelength of the optical signal and the defined wavelength, and for using the correlation signal to adjust at least one of the manufacturing parameters to make the optical device with said given property at the defined wavelength.

12. (Original) A system according to Claim 11, wherein the feedback circuit provide a real-time control of the fabrication of the optical element.

13. (Original) A system according to Claim 11, wherein the film transmits a signal modulated by the difference between the defined wavelength and the given wavelength of the optical signal, and the control circuit includes a sensor to receive the signal transmitted from the film and to generate a signal representing said difference.

14. (Original) A system according to Claim 13, wherein the feedback circuit processes the signal generated by the sensor to generate the correlation signal.

15. (Original) A system according to Claim 11, wherein the light subsystem directs the optical signal through the film.

16. (Original) A system according to Claim 11, wherein the light subsystem directs the optical signal to the film, and the optical signal is then reflected from the film.

17. (Original) A system according to Claim 11, wherein:

the depositing means includes means for depositing the material on the substrate at an adjustable rate; and

the feedback circuit includes means for using the correlation signal to adjust the rate at which the material is being deposited on the substrate.

18. (New) A system according to Claim 17, further comprising a voltage bias source located in series between the dither service and the light and system, and wherein:

the voltage bias source generates a voltage signal and applies said voltage signal to the light subscription; and

the dither source applies the dither signal to the voltage bias source to dither said voltage signal to cause said dithering of the given wavelength of the optical signal.

19. (New) A system according to Claim 18, wherein:

the optical signal interacts with the film being formed to generate a derived optical signal;  
and

the feedback circuit includes a multiplier to multiply the derived optical signal and the dither signal.